MSC/MST-OPS-1

SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

Operators Manual

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SECTION 1
Definitions and Abbreviations

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MANUAL USAGE

This technical manual only contains information required to safely operate the MSC/MST. See the appropriate Maintenance and Operators Safety Manual for specific vehicle system information and maintenance procedures. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the MSC/MST must become familiarized with all the safety messages.

If your system is not covered in this manual please contact MEGA Corp. Product Support Group at:
US toll free: 1-800-345-8889
Direct: 1-505-345-2661 or visit our website at www.megacorpinc.com for more detailed contact information.

See the proper manufacture specific Operation & Maintenance, Safety Manuals and Service Manuals for detailed chassis specific system information and chassis specific maintenance procedures.

⚠ WARNING

Due to the nature of these processes, ensure that all safety information, warnings and instructions are read and understood before any operation or any maintenance procedures are performed. Some procedures take place with heavy components and at moderate heights, ensure proper safety procedures are maintained when performing these actions. Failure to use and maintain proper safety equipment and procedures will cause injury, death or damage to equipment.

WARNING, CAUTION AND NOTES

The following definitions are found throughout the manual and apply as follows:

⚠ WARNING

Operating procedures and techniques, which could result in personal injury and/or loss of life if not carefully followed.

CAUTION

Operating procedures and techniques, which could result in damage to equipment if not carefully followed.

NOTE

Operating procedures and techniques that are considered essential to emphasize.

USE OF SHALL, WILL, SHOULD AND MAY

Shall and **Will** – Used when application of a procedure is mandatory.

Should – Used when application of a procedure is recommended.

May - Used to indicate an acceptable or suggested means of accomplishment.

SECTION 1
Definitions and Abbreviations

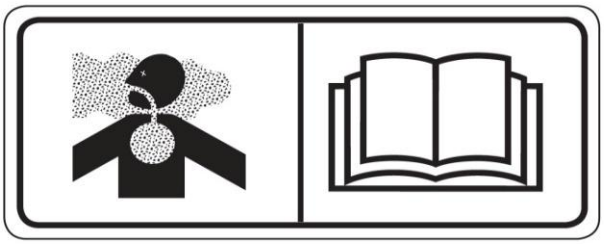
SAFETY MESSAGES

There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

Make sure that all of the safety messages are legible. Clean the safety messages or replace the safety messages in you cannot read the words. Replace the illustrations if the illustrations are not legible. When you clean the safety messages, use a cloth, water and soap. Do not use solvent, gasoline or other harsh chemicals to clean the safety messages. Solvents, gasoline or harsh chemicals could loosen the adhesive that secures the safety messages. Loose adhesive will allow the safety messages to detach.

Replace any safety message that is damaged or missing. If a safety message is attached to a part that is replaced, install a new safety message on the replacement part.

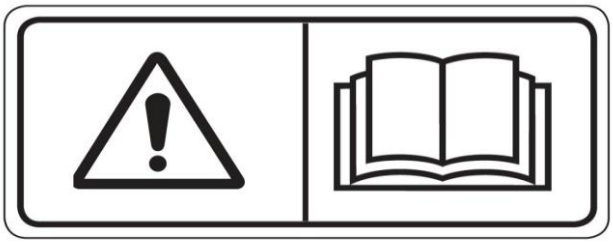
Toxic Gas Hazard (1)
This safety label is located on the side of the tank and at all water fill entrances.



⚠ WARNING

Cutting or welding operation on the inside of the tank can cause the accumulation of toxic gases. Read and understand instructions and warnings in the Maintenance Manual. Failure to provide proper ventilation or breathing apparatus while conducting these operations may result in serious injury or death.

Do Not Operate (2)
This safety label is located on the outside of the front and rear control boxes. (If equipped)

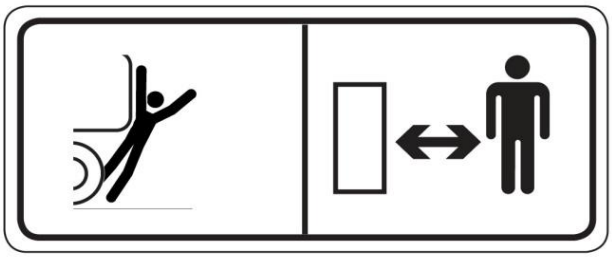


⚠ WARNING

Do not open this control box unless you read and understand the instructions and warnings in the Operator and Maintenance Manual. Failure to follow instructions or heed the warnings could result in serious injury or death.

SECTION 1
Definitions and Abbreviations

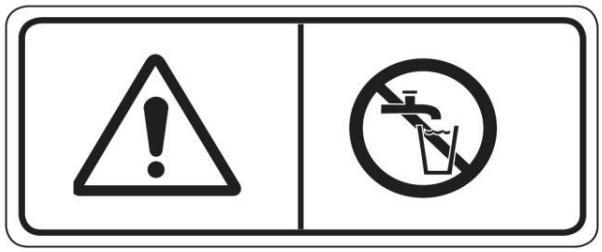
Backing Runover Hazard (3)
This safety label is located on the rear of the tank and inside the cab.



⚠ WARNING

The vehicle is equipped with a back-up alarm. Alarm must sound when operating this vehicle in reverse. Failure to maintain a clear view in the direction of travel could result in serious injury or death.

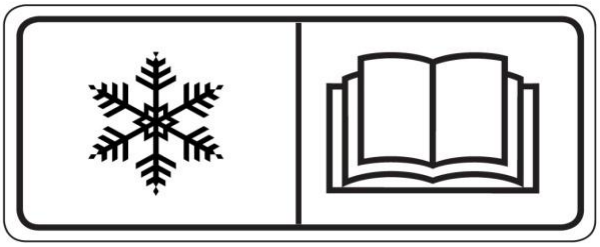
Non-Potable (5)
This safety label is located on the side of the tank and sump drain.



⚠ WARNING

Water held within tank is not potable. Do not use tank for transport of water intended for human or animal consumption or serious injury or death may result.

Freezing (4)
This safety label is located on the side of the tank, at the sump drain, and on the pump.



⚠ WARNING

Drain tank, fill pipe and valve in freezing weather. Refer to the Operator and Maintenance Manual for the procedure to follow.

Do Not Hoist While in Motion (6)
This safety label is located inside the cab.

⚠ WARNING

Do not engage hoist cylinders while vehicle is in motion. Before engaging hoist STOP the vehicle. Do not engage hoisting cylinders unless you read and understand the instructions and warnings in the Operator or Maintenance Manual. Failure to follow instructions or heed the warnings will result in injury or death.

SECTION 1
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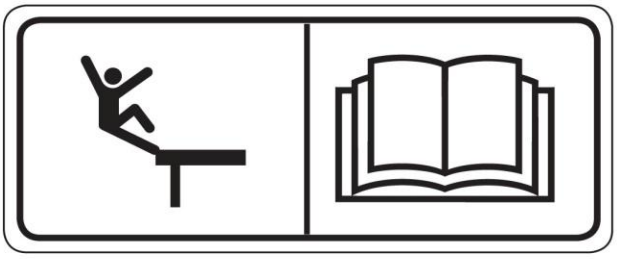
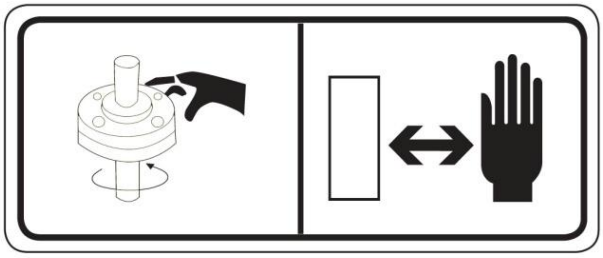
Fall Hazard (7)
This safety label is located at the top of the front and rear of the tank.



⚠ WARNING

Do not walk on the top of tank without fall arrest PPE. Serious injury or death could occur from a fall.

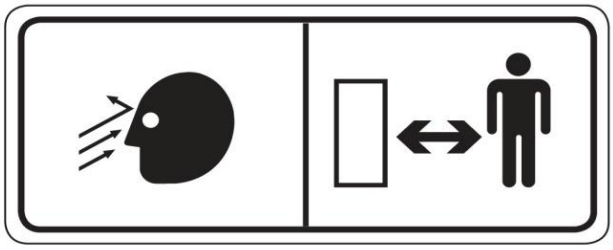
Rotating Shaft (8)
This safety label is located on the pump.



⚠ WARNING

Do not place your hand or tools within pump bell while pump is rotating and/or pressure held within the motor supply hose. Refer to the Operator and Maintenance Manual for the procedures to operate and maintain the pump. Failure to follow proper procedures could result in serious injury.

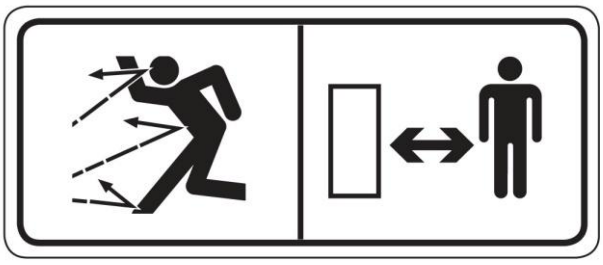
High Pressure Sprayheads (9)
This safety label is located on the spraybar.



⚠ WARNING

Do not operate sprayheads until all personnel are a safe distance away from the vehicle.

High Pressure Monitor (10)
This safety label is located on top of the cab control box.



⚠ WARNING

Do not operate the monitor until all personnel are a safe distance away from the vehicle.

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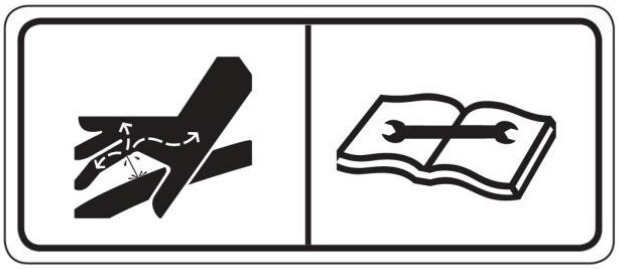
High Pressure Motor (11)
This safety label is located on the hydraulic motor.



⚠ WARNING

Hydraulic motor and supply lines contain oil under high pressure. Improper removal and repair procedures could cause severe injury. To remove or repair, instructions in the Maintenance Manual must be followed.

Confined Space (12)
This safety label is located near water tank access and fill ports.

⚠ WARNING

Do not enter confined spaces without following established site specific procedures. Failure to follow proper safety procedures will result in serious injury or death.

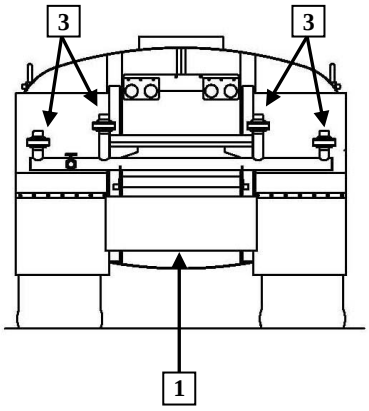
ABBREVIATIONS

BFV – Butterfly Valve
cc – Cubic Centimeters
CCW – Counter Clockwise
CW - Clockwise
fl. oz. – Fluid Ounce
FT - Feet
FPM – Feet Per Minute
GPM – Gallons Per Minute
IN/SQ FT – inches per Square Feet
KM-H – Kilometers Per Hour
Kg – kilograms
Kpa - Kilopascals
l – liters
lpm – Liters per minute
LT – Left as viewed from the operators position facing forward
m - meters
MPH – Miles Per Hour
MSC/MST – Mega Scraper Conversion
Nm – Newton meters of torque
psi - pounds per square inch
RPM – Revolutions Per Minute
RT – Right as viewed from the operators position facing forward
SQ FT – Square Feet
VDC – Volts, Direct Current

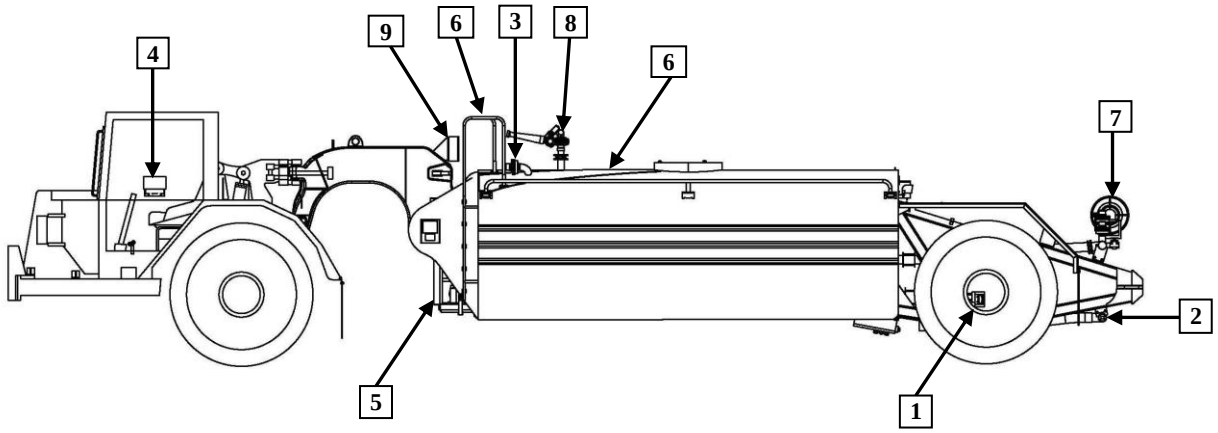
SECTION 1
Definitions and Abbreviations

MSC/MST Overview

REAR VIEW



SIDE VIEW



1. WATER PUMP& HYDRAULIC MOTOR
2. DUMP BAR
3. SPRAY HEADS
4. CAB CONTROL
5. SUCTION PUMP STATION
6. HAND RAIL & WALKWAY
7. HOSE REEL
8. MONITOR
9. SOLENOID BOX

SECTION 2
System Description

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WATER TANK (MSC/MST)

The MEGA steel water tank consists of a water tunnel, primary floor, vertical baffles, bulkheads, outer skins, internal piping and external piping. The tank design is patented and known as the MEGA Anti-surge Stabilization Tube (MAST).

The MAST is the backbone of the structure and provides mounting for transverse baffles. The baffles add to tank strength and dampen water surges. The forward and rear baffles are reinforced with vertical beams to provide mounting for the gooseneck and rear axle bogie respectively. External and internal piping is also used to carry water from the water pump to spray heads, monitor, spray bar, hose reel, dump bar and tank drain.

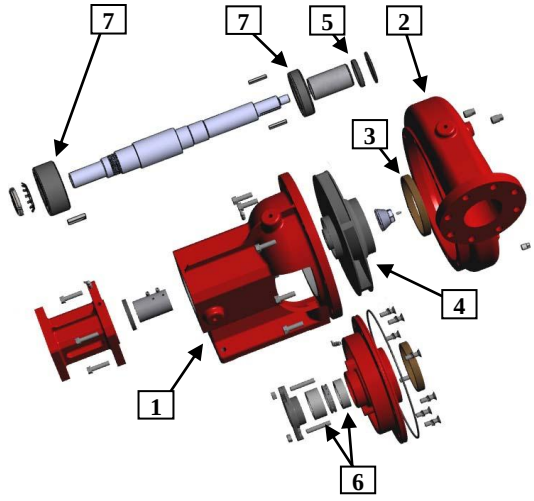
NOTE

Early MSC/MST's may have a Berkley water pump (B4J) installed. Contact MEGA Corp for more information.

WATER PUMP

MSC/MST units are configured with different types of water pumps and are based on the size of the water tank. Typically the 5,000 – 7,000 gallon tanks are configured with a smaller pump (4 inch inlet & 3 inch outlet) while the 8,000 – 12,000 gallon tanks are configured with the larger water pump (6 inch inlet & 4 inch outlet). The water pumps are very similar in design and for the purposes of this manual the M-4 (6 inch inlet & 4 inch outlet is used to present component information.

M-4 WATER PUMP



M4 Water pump major components and their function are:

1. **Bracket** – Main frame of the pump that allows a pump to be bolted to the tanker and provides the means to direct mount the hydraulic drive motor.

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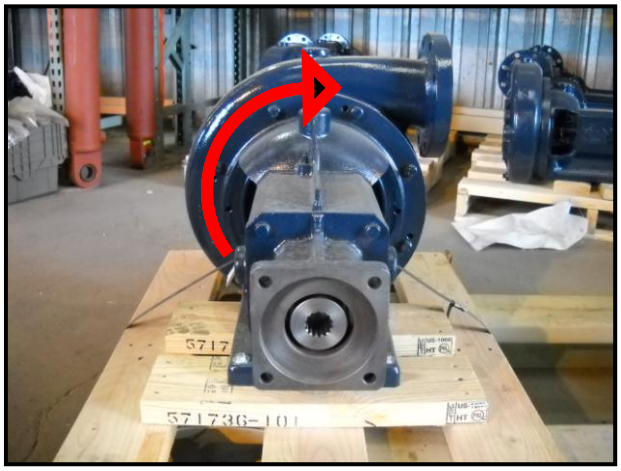
Definitions and Abbreviations

2. **Volute Case** – A "snail shell" shaped case that encloses the impeller. It is narrow at the center and enlarges from there to the discharge area.
3. **Wear Ring** – Acts as a bearing surface between the impeller and volute case. Constructed of bronze material.
4. **Impeller** – Rotating wheel attached to the shaft that accelerates the speed of the water producing water flow and pressure.
5. **Shaft Seal** – Confines grease to the inner and outer bearing area while keeping foreign material from entering the bearing area and seals water inside the volute case.
6. **Rope Seal** – Provides a seal around the rotating pump shaft at the volute case. Constructed of a graphite rope material that is designed to drip water and allow shaft lubrication.
7. **Upper/Lower Bearings** - Provide roller surface for the pump shaft

M-4 PUMP DRIVE MOTOR AND CROSSOVER ASSEMBLY

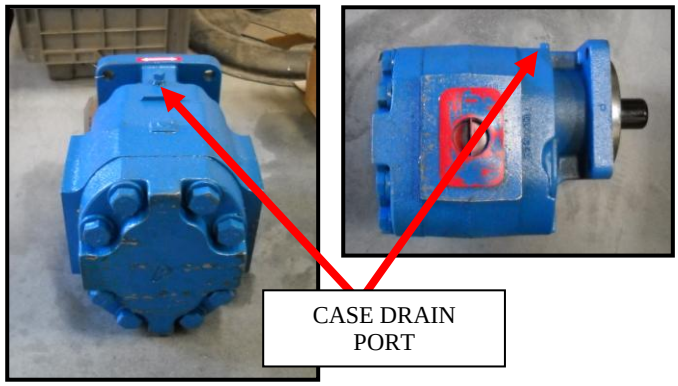
The M-4 pump rotates clockwise as viewed from the drive end of the assembly.



Clockwise rotation as viewed from the drive end of the water pump assembly

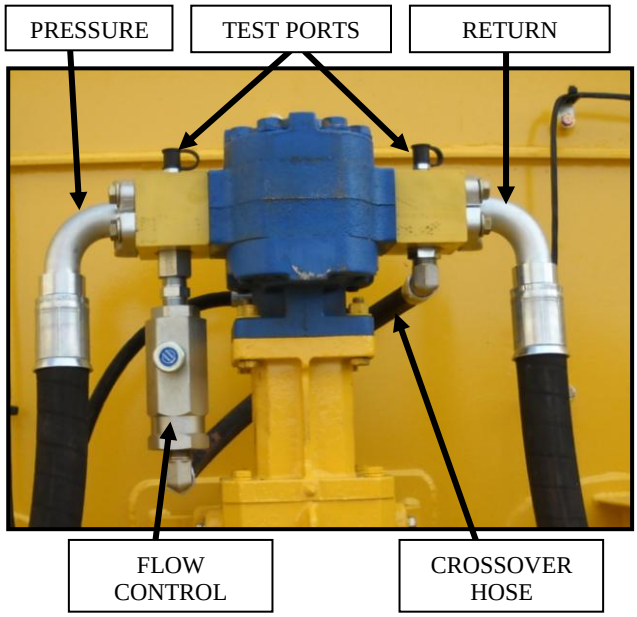
The hydraulic drive motor may be installed in 4 different orientations depending on the water pump location or application.

Hydraulic Drive Motor Port Identification
The hydraulic drive motor requires hydraulic flow from a valve to the motor pressure port, return oil flow to the hydraulic reservoir and a free to tank case drain.



Hydraulic Drive Motor Speed Control (Crossover Assembly)

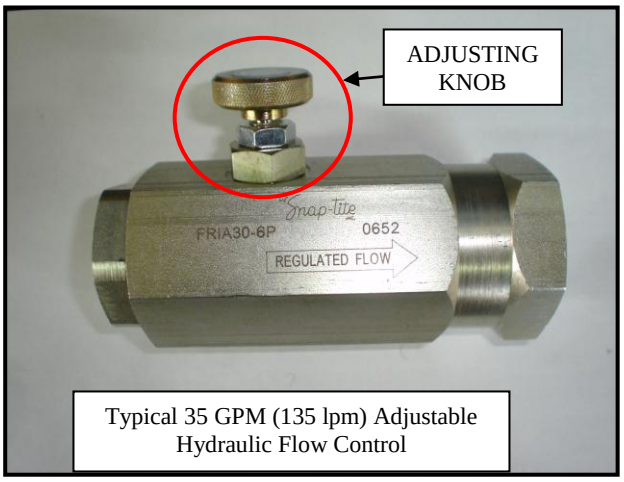
The hydraulic drive motor speed control (Crossover Assembly) consists of a flow control valve, 2 hydraulic manifolds, crossover hose and test ports.



SECTION 2
System Description

Hydraulic Flow Control Valve

The hydraulic flow control is directional. The arrow on the body indicates the direction of oil flow to meter the bypassing oil. The adjusting knob on the valve will allow adjustment of the oil flow to bypass the drive motor, up to 35 GPM (135 lpm) or up to 700 RPMs (RPM increase/decrease will vary depending on the size of hydraulic drive motor the unit is equipped with). If the flow control is reversed, the flow control adjusting knob will not function and the full flow capacity of the valve will bypass. This can result in water pump rpm being below specifications with no adjustment capability of the adjusting knob. By turning the adjusting knob clockwise the hydraulic oil that is bypassing will be reduced, increasing the speed of the water pump. Turning the knob counter-clockwise will increase the volume oil being bypassed reducing the water pump speed. The flow control valve is typically mounted on the PRESSURE manifold of the hydraulic drive motor.



Typical 35 GPM (135 lpm) Adjustable Hydraulic Flow Control

HYDRAULIC DRIVE MOTOR ACTIVATION

The hydraulic drive motor on MSC/MST's are typically driven by the chassis implement hydraulic system. The activation can be controlled by the following;

Pilot Operated Diversion Valve – A remote mounted diversion valve that receives an electric signal from the cab control pump switch to activate a pilot control to move a spool within the diversion valve redirecting the hydraulic oil to flow to the water pump drive motor. Typically this type of valve is installed between the hoist pump and the hoist valve.

Existing Mechanically Operated Implement Valve – Typically used on early model trucks with a pneumatic system. This system is operated by the existing cab control lever. When the lever is moved to move a spool valve which divert hydraulic oil to the water pump drive motor.

CAB CONTROL SYSTEM

MSC/MST units can be configured with a manual pneumatic, electro-pneumatic or electro-hydraulic control system.

MANUAL PNEUMATIC

Multi-function control box mounted in the cab to control all water tank functions. Spray system head and auxiliary functions are controlled by using manual pneumatic levers, accessory switches and imbedded joystick. The cab control requires 24 VDC power to operate.

SECTION 2
System Description

ELECTRO-PNEUMATIC SYSTEM

Multi-function control box that is mounted in the vehicle cab to control all water tank functions. Controls are available for the monitor, intermittent spray, water pump, work lights, foam suppression, adjustable nozzle, system, spray heads, spray bar, gravity dump bar and tank drain valve. The control box also provides indications of tanker water level and a system fuse holder. The cab controls requires 24 VDC vehicle power to operate.

The control functions operate as follows:

Control	Function
Joystick	Sends command signals to the logic box (electric monitor) or hydraulic control valve assembly (hydraulic monitor) to move the monitor left, right, up and down.
TIMER OFF	Sets OFF time (5 second increments) between timer cycles of selected spray heads and dump bar when the timer switch is in the intermittent position.
TIMER ON	Sets ON time (5 second increments) between timer cycles of selected spray heads and dump bar when the timer switch is in the intermittent position.
PUMP	Routes vehicle hydraulic system pressure and flow to the water pump hydraulic drive motor.
MONITOR	Opens the monitor BFV.
LIGHTS	Provides power to work lights.
FOAM	Open or closes the foam concentrate tank in-line control valve.
INTERMITTENT /CONSTANT	Activates or deactivates system timer function.
AUX	Reserved for specialized functions.
ADJUSTABLE NOZZLE	Adjusts monitor nozzle from FOG/FAN to STREAM.
AUX	Reserved for specialized functions.
WATER LEVEL	Indicates tank water level.
SYSTEM	Provides power for all cab control functions.
LT BUMPER	Opens or closes left front bumper spray head.
LT VSS	Opens or closes left vertical side spray head.
LT REAR	Opens or closes left rear spray head.
LT CENTER	Opens or closes left center rear spray head.
RT CENTER	Opens or closes right center rear spray head.
RT REAR	Opens or closes right rear spray head.
RT VSS	Opens or closes right vertical side spray head.
RT BUMPER	Opens or closes right front bumper spray head.
DUMP BAR	Opens or closes dump bar BFV.
DRAIN	Opens or closes tank drain BFV.

SECTION 2
System Description

ELECTRO- HYDRAULIC SYSTEM
(CAT 621H only)

A multi-function main control box with a remote mounted joystick box is mounted in the vehicle cab. These two boxes control all water tank functions. The main control box operates the system power, water pump, spray heads, intermittent spray, work lights hose reel, dump bar and tank drain valve. The main control box also provides indications of tanker water level and water pump protection features. The remote mounted joystick box operates the monitor, adjustable nozzle and foam suppression. The cab controls require 12/24 VDC vehicle power to operate.

The control functions operate as follows:

Control	Function
POWER	Provides power for all cab control functions.
PUMP	Routes vehicle hydraulic system pressure and flow to the water pump hydraulic drive motor.
INTERMITTENT /CONSTANT	Activates or deactivates system timer function.
TIMER ON	Sets ON time between timer cycles of selected spray heads and dump bar when the timer switch is in the intermittent position.
TIMER OFF	Sets OFF time between timer cycles of selected spray heads and dump bar when the timer switch is in the intermittent position.
LIGHTS	Provides power to work lights.
WATER LEVEL	Indicates tank water level.
DRAIN	Opens or closes tank drain BFV.
DUMP BAR	Opens or closes dump bar BFV.
AUX	Reserved for specialized functions.
HOSE REEL	Activates the water supply for the hose reel
LT VSS	Opens or closes left vertical side spray head.
LT REAR	Opens or closes left rear spray head.
LT CENTER	Opens or closes left center rear spray head.
RT CENTER	Opens or closes right center rear spray head.
RT REAR	Opens or closes right rear spray head.
RT VSS	Opens or closes right vertical side spray head.
Joystick	Sends command signals to the hydraulic control valve assembly to move the monitor left, right, up and down.
FOAM	Open or closes the foam concentrate tank in-line control valve.
ADJUSTABLE NOZZLE	Adjusts monitor nozzle from FOG/FAN to STREAM.
MONITOR	Opens the monitor BFV.

SECTION 2
System Description

Electro-Hydraulic System Special Features

The electro-hydraulic control system is equipped with two water pump protection features.

1. The water pump will automatically turn off when the water level indicator reads EMPTY (red indicator light flashing). The tank must then be filled until the water level indicator reads above EMPTY in order to activate the water pump again.

2. The water pump will automatically turn off if there is no function switch ON. The function switches include: spray heads, monitor, hose reel, drain or any specialized function using an AUX switch. The water pump will be able to be reactivated once one or more of these function switches are turned ON.

The electro-hydraulic control system is equipped with an intermittent spray function that, at timed intervals, turns ON/OFF any spray head or dump bar function that is switched to the ON position. With the intermittent switch is in the ON position and the timer in the ON cycle, the intermittent and function switch lights will be on. When the timer changes to the OFF cycle the intermittent switch light will blink and the function switch lights will be off.

SECTION 2
System Description

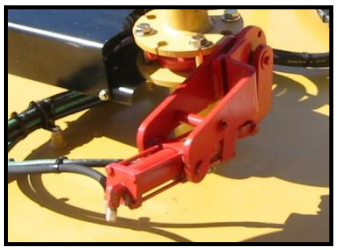
MONITOR SYSTEM
The system is comprised of a monitor (hydraulic or electric), hydraulic control valve assembly or logic box, butterfly valve assembly, nozzle and controls.

MONITOR (Hydraulic)

A metal waterway that directs a stream of water in both elevation (up-down) and rotation (right-left). Hydraulic motors move the waterway based upon hydraulic flow from the hydraulic control valve assembly as commanded by the cab control joystick. The monitor is threaded to a flanged pipe that mounts directly above the BFV. The monitor also provides mounting for a variety of different adjustable nozzles.

HYDRAULIC CONTROL VALVE ASSEMBLY

The assembly contains three hydraulic solenoid valves that direct hydraulic pressure to the hydraulic motors on the monitor and BFV cylinder as commanded by the cab control box. A pressure relief valve is incorporated in the manifold block to protect the monitor system against any over pressurization conditions. The assembly is mounted to the tank lower flange and receives hydraulic pressure from the vehicle hydraulic pump.

HYDRAULIC BFV ASSEMBLY


A hydraulically operated valve that opens or closes to control water flow to the monitor.

The hydraulic cylinder receives hydraulic pressure from the hydraulic control valve or solenoid control box assembly as commanded by the cab control monitor switch. The assembly is clamped between the upper and lower pipe flanges.

MONITOR (Electric)

A metal waterway that directs a stream of water in both elevation (up-down) and rotation (right-left). 24 VDC electric motors move the waterway based upon filtered electronic signals from the logic box as commanded by the cab control joystick. The monitor is threaded to a flanged pipe that mounts directly above the BFV. The monitor also provides mounting for a variety of different nozzles.

ELECTRO-PNEUMATIC BFV ASSEMBLY

An electro-pneumatic valve that controls the flow of water to the monitor. A 24 volt DC solenoid receives commands from a cab control monitor switch through the logic box to route pressurized air to an air chamber which opens or closes a 3 inch valve. The assembly is clamped between upper and lower pipe flanges.

SECTION 2
System Description

MONITOR NOZZLES AND STREAM SHAPERS

Smooth Bore Nozzle

A cone shaped 1.5 inch diameter nozzle that directs water flow. The nozzle has a built in stream shaper that smoothes water flow to increase water stream distance.

Smooth Bore (Stackable)

A segmented cone shaped nozzle that directs water flow. The nozzle opening is adjusted by removing segments to acquire the most efficient nozzle opening for a given water pump operating pressure. Nozzle segments diameters are 1 ⅜ inch, 1 ½ inch, 1 ¾ inch and 2 inch. The nozzle requires and in-line stream shaper to increase water stream distance.

In-Line Stream Shaper

A performance enhancer that is mounted between the monitor outlet and the selected straight bore nozzle. The stream shaper pathway is a honeycomb style channel designed to efficiently shape a water stream to maximum water stream distance.

Manual Adjustable Nozzle

Fog/Stream: A modified **s**traight bore nozzle that allows the operator to manually adjust selected water stream patters from fog to stream. Some nozzles are configured for fire suppression foam eduction.

Fan/Stream: A modified straight bore nozzle that allows the operator to manually adjust selected water stream patters from flat fan to stream. The flat fan pattern orientation is adjustable from horizontal to vertical by reorienting the nozzle on the monitor.

Remote Adjustable Nozzle (Electric/Hydraulic)

A modified straight bore nozzle that allows the operator to remotely adjust selected water stream patters from fog to stream from the cab control. The nozzle inner or outer barrel is moved by an electric or hydraulic actuator to obtain the fog or stream pattern. Some nozzles are configured for fire suppression foam eduction.

SECTION 2
System Description

Fan/Stream

A modified straight bore nozzle that allows the operator to remotely adjust selected water stream patters from flat fan to stream from the cab control. The nozzle inner or outer barrel is moved by an electric actuator to obtain the fan or stream pattern. The flat fan pattern orientation is adjustable from horizontal to vertical by reorienting the nozzle on the monitor.

SPRAY SYSTEM

The spray head system consists of 4, 6 or 8 hydraulic or pneumatic actuated spray heads, cab controls, solenoid control box assembly and hydraulic or pneumatic hosing.

PNEUMATIC SPRAY HEAD

A two piece aluminum valve body and adjustable ring mounted to a water supply header pipe. The upper portion of the valve body is an air chamber with a diaphragm and guide disk assembly attached to the bottom. The air chamber receives pressurized air from the solenoid control box as commanded by the cab control switch. When the upper portion of the valve body is pressurized the guide disk will seal the opening on the lower portion of the valve and stop water flow. When the cab control system is OFF and the water pump is OFF the air chamber incorporates a spring that will apply pressure to the guide disk assembly and seal the opening on the lower portion of the valve and stop flow. When air pressure is removed from the upper portion of the valve body when the water pump is ON and the cab control switch ON, pressurized water from the header pipe will unseat the guide disk and water will flow from the lower portion of valve.

HYDRAULIC SPRAY HEAD

A two piece aluminum valve body, hydraulic cylinder and adjustable ring mounted to a water supply header pipe. The upper portion of the valve body contains a hydraulic cylinder that receives hydraulic pressure from the system solenoid control box as commanded by the cab control switch. When the hydraulic cylinder on the upper portion of the valve body is pressurized the cylinder extends to contact the guide disk and seal the opening on the lower portion of the valve and stop water flow. When the cab control system is OFF and the water pump is OFF the upper valve body incorporates a spring to apply pressure to the guide disk to seal the opening on the lower portion of the valve and stop flow. When the spray head switch is turned on hydraulic pressure retracts the hydraulic cylinder and pressurized water from the header pipe will unseat the guide disk and water will flow from the lower portion of valve.

SECTION 2
System Description

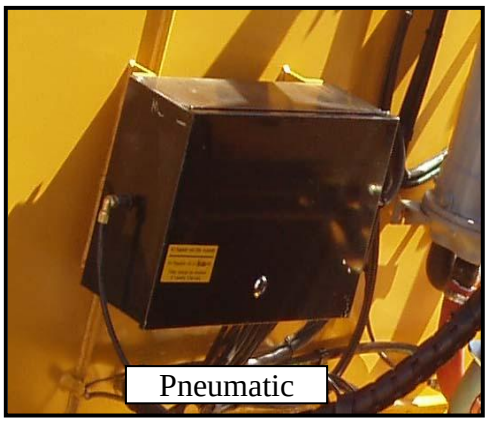
Spray Head Adjustable Rings

The adjustable ring is used to control fan width and water flow. The ring may be loosened and rotated to expose more or less of the lower valve opening to control water fan width from 15° to 90°. The ring also may be used rotated to a 1/4 inch or 3/8 inch slot as shown in figures below to increase or decrease overall water flow. The greater to opening the great the water flow.

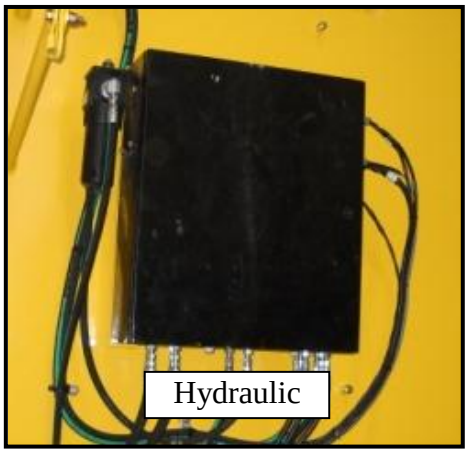
1/4 inch

3/8 inch

SOLENOID CONTROL BOX



Pneumatic



Hydraulic

The control box assembly is mounted to the forward bulkhead or the rear of the gooseneck of the MSC/MST. The assembly contains pneumatic or hydraulic solenoid valves that direct pneumatic or hydraulic pressure to the spray head as commanded by the cab control box. The solenoids receive pneumatic pressure from the vehicle or hydraulic pressure from water pump oil circuit and 24 VDC power from the cab control box.

SECTION 2
System Description

DUMP BAR

A spray bar that contains several rows of 3/8 inch drain holes to dispense water. A hydraulically operated BFV controls the water supply to the dump bar. The BFV is controlled electrically from the cab control box and is actuated by a hydraulic cylinder. The actuators receive hydraulic pressure from the solenoid control box assembly. Dump bars can be either gravity or pressure fed.

HOSE REEL

A reel assembly that is located on the bottom aft end of the water tank fitted with a 1 inch or 1.5 inch diameter reinforced rubber hose and a fire fighting style nozzle. The hose reel assembly receives pressurized water from the pressurized manifold on the back of the tank to operate.

TANK DRAIN

A hydraulic BFV attached to the water tank pressure pipe is used to drain water from the water tank. The BFV is controlled electrically from the cab control box and is actuated by a hydraulic actuator. The actuators receive hydraulic pressure from the solenoid control box assembly. Tank drains can be either gravity or pressure fed.

FIRE SUPPRESSION SYSTEM

A system that consists of a 120 or 60 gallon stainless steel holding tank, an electric or pneumatic actuated shut-off valve, in-cab control switch, hosing and a foam eduction nozzle mounted to the monitor.

FOAM CONCENTRATE TANK

A stainless steel tank mounted in the forward upper portion of the water tank. The holding tank contains a supply tube that extends to the bottom of the tank and connected to a flexible hose at the top of the tank and then routed to the foam agent shut-off valve. The tank also contains a pressure/vacuum cap which keeps foreign matter out of the tank while providing for pressure relief and air displacement during temperature changes.

SECTION 2
System Description

ELECTRIC/PNEUMATIC SHUT-OFF VALVE

The in-line shut-off valve is mounted on the foam tank upper lip and is controlled by the in-cab control FOAM switch. The shut-off valve is actuated by either an electric or pneumatic actuator that is controlled by the in-cab control switch. Once the shut-off valve is opened, foam concentrate will flow from the holding tank to the monitor nozzle if the monitor and water pump switches are ON.

FOAM EDUCTION NOZZLE

A manual or remote adjustable (fog/stream) nozzle is attached to the monitor waterway. The nozzle inner housing uses monitor high pressure water to create a venture effect that will create a suction force that pulls foam concentrate from the holding tank. Once foam concentrate is flowing, the nozzle proportions foam concentrate, water and air to produce finished foam. The nozzle can be adjusted to allow control of foam solution at a rate of 1%, 3% or 6%. Rate adjustment is obtained by replacing a removable disk.

BRAKING SYSTEM

MSC/MST PRIME MOVERS

See the prime mover Operator and Service Manual for brake system information.

MSC/MST 611/615

See the CAT 611/615 Operator and Service Manual for brake system information.

MSC/MST 613

See the CAT 613 Operator and Service Manual for braking system information

MSC/MST 621H

See the CAT 621H Operator and Service Manual for braking system information.

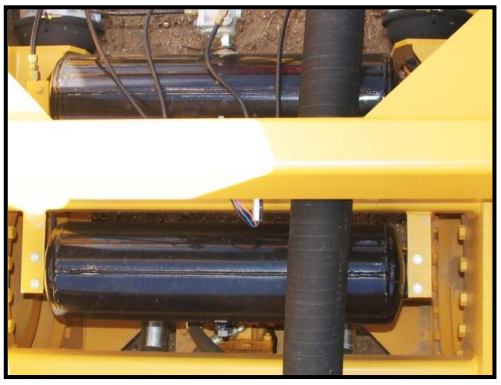
For further information contact MEGA Corp. Product Support Group at:
US toll free: 1-800-345-8889
Direct: 1-505-345-2661 or visit our website at www.megacorpinc.com for more detailed contact information.

MSC/MST 621G & 631G

The MSC/MST rear brake system is integrated with the existing tractor parking, service and emergency brakes. All three systems are activated with the existing brake controls located in the tractor cab. See the CAT 621G and 631G operator and service manual for additional tractor brake information.

The MSC/MST rear brake system consists of a wheel group, two additionally air tanks, pneumatic manifold assembly, pneumatic brake relay valve, brake pods, solenoid valve, pressure switch, pressure sending unit and hosing.

AIR TANKS



The MSC/MST is equipped with two 8 inch x 32 inch air cylinder mounted to the MSC/MST rear bogie that store 110-130 psi air. The cylinders receive pressurized air from the tractor primary air tank mounted under the tractor cab.

SECTION 2
System Description

TANK PRESSURE SENDING UNIT

A 24 VDC pressure sending unit is mounted to the rear MSC/MST air tank and is wired into existing tractor brake pressure indicating and warning systems. The sending unit provides air pressure sensing for the tractor air pressure gauge mounted in the dash. The sending unit also provides a signal to the brake low pressure warning system that sounds an audible warning tone when brake supply pressure drops below allowable limits.

PNEUMATIC MANIFOLD ASSEMBLY

A pneumatic manifold mounted in the rear bogie used to route air pressure for service, parking and emergency brake operation. The manifold also provides mounting for a check valve, parking brake/emergency solenoid valve and parking brake pressure switch.

CHECK VALVES

A spring operated valve allowing air flow in a predetermined direction. A one-way check valve is located at the MSC/MST rear air tank tractor air supply in. A double-check valve is located on the pneumatic manifold.

PARKING /EMERGENCY BRAKE SOLENOID

A 24 VDC electrical solenoid that opens or closes to control the parking or emergency brake function. The solenoid valve responds to electrical signals as commanded by the parking or emergency brake in the tractor cab. The solenoid valve will open to bleed off parking/emergency brake release pressure from the brake pods. This release of air pressure will cause the parking/emergency brakes to be applied.

PARKING BRAKE PRESSURE SWITCH

A 24 VDC pressure switch used to illuminate the parking brake warning light in the tractor cab. The sensor will turn on the parking brake warning light when parking brake release pressure drops below allowable limits.

SERVICE BRAKE RELAY VALVE

A pneumatic relay that controls and routes air tank activation pressure to both brake pods. The relay controls air pressure applied to the brake pods as commanded by a pneumatic signal generated by activating the service brake pedal located in the tractor cab.

SECTION 2
System Description

BRAKE PODS

A pneumatic cylinder designed to extend or retract and apply service, parking or emergency brakes. The pods are mounted to the MSC/MST rear bogie and are connected to the wheel group brake activation lever. The pod contains a coil spring and responds to pressure received from the brake relay valve as commanded by service brake pedal. The pod will also apply parking or emergency brakes when one side of the cylinder is depressurized when commanded by the activation of the parking or emergency brakes. Lose of pneumatic pressure allows the brake pod coil spring to extend the rod end.

THEORY OF OPERATION

PARKING BRAKE

The parking brake is applied by activating the parking brake switch in the tractor cab. Once the switch is moved to the park position an electrical signal is sent to the parking brake solenoid valve mounted on the rear bogie pneumatic manifold. The sent signal will open the solenoid valve allowing pneumatic pressure to decrease from one side of the brake pod. The brake pod coil spring can now overcome air pressure and extend the brake pod rod end attached to the wheel group brake lever and apply the brakes. Once parking brake pneumatic pressure drops below allowable limits, the parking brake pressure switch mounted on the pneumatic manifold will close and illuminate the parking brake warning light in the cab of the tractor.

The parking brake is released by activating the parking brake switch. Once the switch is moved an electric signal is sent to close the parking brake solenoid valve. The valve closing will allow pneumatic pressure from the pneumatic manifold to be routed to the brake pod. This pressure increase will eventually overcome the brake pod coil spring and retract the brake pod cylinder rod end attached to the brake pod releasing the brakes. As pressure increases above allowable limits, the parking brake pressure switch will turn off the parking brake warning light in the tractor cab once pressure is above allowable limits.

SERVICE BRAKE

The service brake is applied by pressing down on the service brake pedal in the tractor cab. Pressing down on the pedal will send a pneumatic pressure signal to the service brake relay valve mounted on the rear bogie. The sent signal will release pneumatic pressure from the brake pod chamber allowing the pod coil spring to extend the rod end and apply service brakes.

The service brake is released by releasing the brake pedal. Once the pedal released a pneumatic signal is received by the brake relay to increase air pressure to the brake pod. As pneumatic pressure increases the force of the brake pod coil spring is overcome and the service brake is released.

EMERGENCY BRAKE

The emergency brake theory of operation is the same as the parking brake except for the means of activation. Activation is accomplished by using the emergency brake foot switch located on the floor of the tractor cab just left of the service brake pedal.

SECTION 3
Normal Operations

Contents

Description ……..……... 3-1
Before Operations ……..…. 3-1
Operations ……..... 3-2
After Operations ……..…. 3-5

DESCRIPTION

This section provides the vehicle operator with step by step operating procedures for the installed MSC/MST system. The information is separated into before operations, operations and after operations. A pocket size checklist of all listed procedures is also provided in the Appendix for use in the vehicle cab.

BEFORE OPERATIONS

These procedures are used to perform a walk-around inspection of the MEGA water tanker system before use or the beginning of a shift. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Chocks – As Required

2. Vehicle Parking Brake – ON

3. Cab Control Switches – SET OFF

4. Bumper Sprayheads – SECURED & SET

5. Vehicle Hydraulic Tank – SERVICED

6. Gooseneck Lines & Hoses – CHECKED & SECURED.

7. Solenoid Control Box – CHECKED

8. Monitor – CHECKED & SECURED
   A. Nozzle – Check for security and kinking of foam concentrate supply line.

9. (**If Equipped**) Foam Concentrate Level – CHECKED. At least 1 inch from the top of the foam tank.

   ⚠ WARNING

   Ensure PPE fall arrest harness is worn, adjusted properly and attached to an anchor point. Failure to use PPE properly may result in personnel injury or death.

10. Tank Drain Petcocks – CLOSED

11. Sprayheads – SECURED

12. Water Pump – CHECKED
    A. Check to ensure drains are closed.
    B. Check pump case and drive motor for signs of overheating.
    C. Check drive motor and hosing for signs of hydraulic leaks.

13. Hose Reel – CHECKED

SECTION 3
Normal Operations

OPERATIONS

SPRAY HEAD SYSTEM

NOTE

Operating more than 4 spray heads simultaneously will greatly reduce the width and flow of active spray heads.

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. (If Equipped) INTERMITTENT TIMER – SET
    A. TIMER ON/OFF Dials – SET
    B. INTERMITTENT Switch – SET

3. PUMP Switch/Lever – ON

    CAUTION

    Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

4. Individual Spray Heads – SELECTED

Once operations are complete:

5. PUMP Switch/Lever – OFF

    CAUTION

    Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

6. (If Equipped) Cab Control SYSTEM Switch – OFF

DUMP BAR

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. (If Equipped) INTERMITTENT TIMER – SET AS REQUIRED
    A. Timer ON/OFF Dials – SET
    B. INTERMITTENT Switch – SET

3. PUMP Switch/Lever – ON.

    CAUTION

    Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

4. DUMP Bar Switch – ON

Once operations are complete:

5. PUMP Switch/Lever – OFF

    CAUTION

    Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

6. (If Equipped) Cab Control SYSTEM Switch – OFF

SECTION 3
Normal Operations

MONITOR

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. PUMP Switch/Lever - ON

   CAUTION

   Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

3. Monitor – Pointed in a safe direction.

4. MONITOR Switch – ON

5. Monitor Joystick – As Required

6. MONITOR Switch – OFF

Once operations are complete:

7. Monitor Nozzle - STOW

   CAUTION

   Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on monitor joints. Leaving the nozzle in any other position will cause increased wear on monitor joints and result in premature joint failure.

8. PUMP Switch/Lever – OFF

   CAUTION

   Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

9. (If Equipped) Cab Control SYSTEM Switch - OFF

FIRE SUPPRESSION SYSTEM

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. PUMP Switch/Lever - ON

   CAUTION

   Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

3. Monitor – Pointed in a safe direction.

4. FOAM Switch – ON

5. MONITOR Switch – ON

6. Monitor Joystick – As Required

Once operations are complete:

7. FOAM Switch – OFF

8. Monitor – Flow water through the monitor nozzle with the foam switch off to flush foam from the nozzle.

9. MONITOR Switch – OFF

10. Monitor Nozzle - STOW

    CAUTION

    Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on monitor joints. Leaving the nozzle in any other position will cause increased wear on monitor joints and result in premature joint failure.

SECTION 3
Normal Operations

11. PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

12. (If Equipped) Cab Control SYSTEM Switch – OFF

13. Vehicle – Wash or fresh water rinse areas exposed to the foam spray.

TANK DRAIN

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. PUMP Switch/Lever – ON

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

3. DRAIN Switch - ON

4. Water Level – Drain to desired level.

CAUTION

Do not operate the water pump in a dry sump. Dry running operation will cause water pump failure.

Once operations are complete:

5. DRAIN Switch – OFF

6. PUMP Switch/Lever – OFF.

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

7. (If Equipped) Cab Control SYSTEM Switch – OFF.

HOSE REEL

1. Hose Nozzle – CLOSED.

2. Hose – Deploy desired length.

3. Gate Valve - OPEN

4. (If Equipped) Cab Control SYSTEM Switch – ON

5. PUMP Switch – ON.

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

6. (If Equipped) HOSE REEL Switch – ON

7. Vehicle RPM – SET

8. Hose Nozzle – OPEN as desired.

Once operations are complete:

9. Hose Nozzle – CLOSE

10. Vehicle RPM – LOW IDLE

SECTION 3
Normal Operations

11. (If Equipped) HOSE REEL Switch – OFF

12. PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

13. (If Equipped) Cab Control SYSTEM Switch- OFF

14. Gate Valve – CLOSED

15. Hose – Reel in and stow hose nozzle.

AFTER OPERATIONS

These procedures are used to perform a walk-around inspection after using the MEGA water tanker systems. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Vehicle parking brake – ON

2. Cab Control Switches – SET OFF

3. Chocks – As Required

4. Bumper Sprayheads – SECURED & SET

5. Gooseneck Hoses & Lines – CHECKED & SECURED

6. Solenoid Control Box - CHECKED

7. Monitor – CHECKED & SECURED

8. Vehicle Hydraulic Tank – CHECKED AS REQUIRED

9. Tank Drain Petcocks – As Required.

10. Spray Heads – SECURED & SET

11. Water Pump – CHECKED
    A. Water Pump – Check for damage and volute case drain valve set as required.

12. Hose Reel – CHECKED

SECTION 3
Normal Operations

SECTION 4
Limitations

Water Pump ……..……..……..... 4-1

1. WATER PUMP

CAUTION

Do not operate the water pump in a dry sump. Operating the water pump with a dry sump will result in water pump component damage and reduced service life.

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

CAUTION

Limit water pump operation to 2.5 minutes when in a no-flow condition (not using the spray heads, power dump bar, monitor or hose reel). Water pump operation in a no flow condition will cause overheating of the water pump and damage to the shaft bearings.

CAUTION

Avoid any sudden stoppage of water pump (e.g. disengaging water pump above LOW IDLE). Stopping water pump suddenly above LOW IDLE will result in shaft, impeller and drive motor damage.

SECTION 4
Limitations

SECTION 5
Performance

Spray Pattern and Reach ……..... 5-1
Spray System Duration ……..…… 5-1
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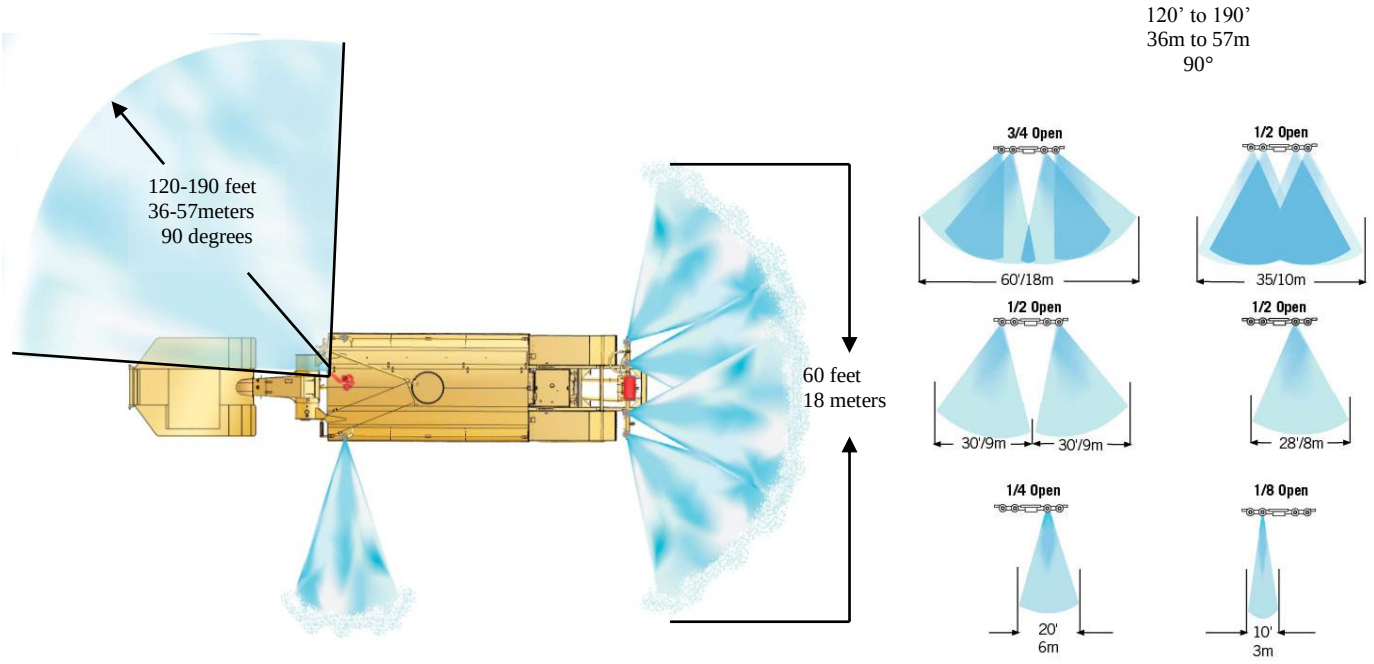
Fire Suppression System …… 5-13

SPRAY PATTERN AND REACH (Typical 9 ft. Spraybar)
The figures below illustrate width and reach of spray heads and monitor. Typical spray head deflector fan adjustments are also depicted.



TYPICAL SPRAY SYSTEM DURATION
The table below contains a standard vehicle spray duration based on spray head deflector opening, vehicle speed and 8,000 gallon capacity (M-4 Water Pump).

Number of Spray Heads and Opening	GPM	Ground Speed (MPH/KPH)	Max. Distance (Miles/Kilometers)
2 Spray Heads@ 1/4 inch	954	10/16	1.5/2.4
2 Spray Heads@ 1/4 inch	954	15/24	2.1/3.3
2 Spray Heads@ 3/8 inch	1243	10/16	1.1/1.7
2 Spray Heads@ 3/8 inch	1243	15/24	1.6/2.5
4 Spray heads @ 1/4 inch	1504	10/16	0.9/1.4
4 Spray heads @ 1/4 inch	1504	15/24	1.3/2.0
4 Spray heads @ 3/8 inch	1572	10/16	0.8/1.2
4 Spray heads @ 3/8 inch	1572	15/24	1.3/2.0

SECTION 5
Performance

PRECISION WATERING

The following tables provide precision watering calculations for the installed spray system. Each table is categorized by size of spray head deflector opening at a full fan width for 2 or 4 spray heads.

1/4 OPENING & FULL FAN (5,000 gal/18,927 lit TANK)

			2 SPRAY HEADS (FLOW 954 gpm/3611 lpm)				4 SPRAY HEADS (FLOW 1504 gpm/5693 lpm)			
	SPEED		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
	MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
U	2	176	1600	96000	0.052	0.084	880	52800	0.095	0.152
U	5	440	4000	240000	0.021	0.033	2200	132000	0.038	0.061
S	10	880	8000	480000	0.010	0.017	4400	264000	0.019	0.030
	15	1320	12000	720000	0.007	0.011	6600	396000	0.013	0.020
M	KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
E	3	53	675	12147	2.181	2.67	371	6679	3.968	4.65
T	8	134	1706	30712	0.863	1.07	938	16885	1.569	1.84
R	16	268	3412	61423	0.431	0.53	1876	33771	0.785	0.94
I	24	402	5119	92135	0.288	0.35	2814	50656	0.523	0.61
C										

3/8 OPENING & FULL FAN (5,000 gal./18,927 lit. TANK)

			2 SPRAY HEADS (FLOW 1243 gpm/4705 lpm)				4 SPRAY HEADS (FLOW 1572 gpm/5950 lpm)			
	SPEED		MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
	MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
	2	176	1354	81231	0.062	0.099	880	57200	0.087	0.140
U	5	440	3385	203077	0.025	0.039	2200	143000	0.035	0.056
S	10	880	6769	406154	0.012	0.020	4400	286000	0.017	0.028
	15	1320	10154	609231	0.008	0.013	6600	429000	0.012	0.019
M	KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
E	3	53	571	10276	2.579	3.68	371	6679	3.968	5.59
T	8	134	1443	25980	1.020	1.47	938	16885	1.569	2.23
R	16	268	2887	51960	0.510	0.74	1876	33771	0.785	1.11
I	24	402	4330	77940	0.340	0.48	2814	50656	0.523	0.74
C										

SECTION 5
Performance

1/4 OPENING & FULL FAN (8,000 gal/30,283 lit TANK)

			2 SPRAY HEADS (FLOW 954 gpm/3611 lpm)				4 SPRAY HEADS (FLOW 1504 gpm/5693 lpm)			
	SPEED		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
	MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
U	2	176	1476	122499	0.065	0.105	936	70213	0.114	0.183
U	5	440	3690	306247	0.026	0.042	2340	175532	0.046	0.073
S	10	880	7379	612495	0.013	0.021	4681	351064	0.023	0.037
	15	1320	11069	918742	0.009	0.014	7021	526596	0.015	0.024
M	KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
E	3	53	444	11112	2.725	2.67	282	6484	4.670	4.65
T	8	134	1124	28094	1.078	1.07	713	16394	1.847	1.84
R	16	268	2248	56188	0.539	0.53	1426	32788	0.924	0.94
I	24	402	3371	84283	0.359	0.35	2138	49183	0.616	0.61
C										

3/8 OPENING & FULL FAN (8,000 gal/30,283 lit TANK)

			2 SPRAY HEADS (FLOW 1243 gpm/4705 lpm)				4 SPRAY HEADS (FLOW 1572 gpm/5950 lpm)			
	SPEED		MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
	MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
U	2	176	1133	88354	0.091	0.145	896	58219	0.137	0.220
U	5	440	2832	220885	0.036	0.058	2239	145547	0.055	0.088
S	10	880	5664	441770	0.018	0.029	4478	291094	0.027	0.044
	15	1320	8496	662655	0.012	0.019	6718	436641	0.018	0.029
M	KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
E	3	53	341	8187	3.699	3.68	270	5395	5.613	5.59
T	8	134	862	20699	1.463	1.47	682	13640	2.220	2.23
R	16	268	1725	41399	0.731	0.74	1364	27280	1.110	1.11
I	24	402	2587	62098	0.488	0.48	2046	40920	0.740	0.74
C										

SECTION 5
Performance

1/4 OPENING & FULL FAN (8,000 gal/30,283 lit TANK)

		2 SPRAY HEADS (FLOW 954 gpm/3611 lpm)				4 SPRAY HEADS (FLOW 1504 gpm/5693 lpm)			
SPEED		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
2	176	1476	122499	0.065	0.105	936	70213	0.114	0.183
5	440	3690	306247	0.026	0.042	2340	175532	0.046	0.073
10	880	7379	612495	0.013	0.021	4681	351064	0.023	0.037
15	1320	11069	918742	0.009	0.014	7021	526596	0.015	0.024
KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
3	53	444	11112	2.725	2.67	282	6484	4.670	4.65
8	134	1124	28094	1.078	1.07	713	16394	1.847	1.84
16	268	2248	56188	0.539	0.53	1426	32788	0.924	0.94
24	402	3371	84283	0.359	0.35	2138	49183	0.616	0.61

3/8 OPENING & FULL FAN (8,000 gal./30,283 lit. TANK)

		2 SPRAY HEADS (FLOW 1243 gpm/4705 lpm)				4 SPRAY HEADS (FLOW 1572 gpm/5950 lpm)			
SPEED		MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
2	176	1133	88354	0.091	0.145	896	58219	0.137	0.220
5	440	2832	220885	0.036	0.058	2239	145547	0.055	0.088
10	880	5664	441770	0.018	0.029	4478	291094	0.027	0.044
15	1320	8496	662655	0.012	0.019	6718	436641	0.018	0.029
KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
3	53	341	8187	3.699	3.68	270	5395	5.613	5.59
8	134	862	20699	1.463	1.47	682	13640	2.220	2.23
16	268	1725	41399	0.731	0.74	1364	27280	1.110	1.11
24	402	2587	62098	0.488	0.48	2046	40920	0.740	0.74

SECTION 5
Performance

1/4 OPENING & FULL FAN (10,000 gal/37,854 lit TANK)

		2 SPRAY HEADS (FLOW 954 gpm/3611 lpm)				4 SPRAY HEADS (FLOW 1504 gpm/5693 lpm)			
SPEED		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
2	176	1845	153124	0.065	0.105	1170	87766	0.114	0.183
5	440	4612	382809	0.026	0.042	2926	219415	0.046	0.073
10	880	9224	765618	0.013	0.021	5851	438830	0.023	0.037
15	1320	13836	1148428	0.009	0.014	8777	658245	0.015	0.024
KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
3	53	556	13890	2.725	2.67	352	8105	4.670	4.65
8	134	1405	35118	1.078	1.07	891	20493	1.847	1.84
16	268	2809	70236	0.539	0.53	1782	40986	0.924	0.94
24	402	4214	105354	0.359	0.35	2673	61479	0.616	0.61

3/8 OPENING & FULL FAN (10,000 gal./37,854 lit. TANK)

		2 SPRAY HEADS (FLOW 1243 gpm/4705 lpm)				4 SPRAY HEADS (FLOW 1572 gpm/5950 lpm)			
SPEED		MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
MPH	FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
2	176	1416	110442	0.091	0.145	1120	72774	0.137	0.220
5	440	3540	276106	0.036	0.058	2799	181934	0.055	0.088
10	880	7080	552212	0.018	0.029	5598	363868	0.027	0.044
15	1320	10619	828319	0.012	0.019	8397	545802	0.018	0.029
KM/H	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(L/M SQ)	(MM)
3	53	426	10234	3.699	3.68	337	6744	5.613	5.59
8	134	1078	25874	1.463	1.47	853	17050	2.220	2.23
16	268	2156	51749	0.731	0.74	1705	34100	1.110	1.11
24	402	3234	77623	0.488	0.48	2558	51151	0.740	0.74

SECTION 5
Performance

FIRE SUPPRESION SYSTEM

The table below shows consumption rates and duration of foam suppression concentrate and water based upon a standard flow rate 500 gpm/1893 lpm and 3% foam proportioning.

Foam Concentrate gallons/liters	**Water** gallons/liters	Duration
15/57	500/1893	1 minute
30/114	1000/3786	2 minutes
60/228	2000/7571	4 minutes
90/341	3000/11,357	6 minutes
120/455	4000/15,142	8 minutes

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Appendix

MSC/MST-OPS(CL)-1
9 Mar 2012

MSC/MST OPERATORS CHECKLIST

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BEFORE OPERATIONS

These procedures are used to perform a walk-around inspection of the MEGA water tanker system before use or the beginning of a shift. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Chocks – As Required

2. Vehicle Parking Brake – ON

3. Cab Control Switches – SET OFF

4. Bumper Sprayheads – SECURED & SET

5. Vehicle Hydraulic Tank – SERVICED

6. Gooseneck Lines & Hoses – CHECKED & SECURED.

7. Solenoid Control Box – CHECKED

8. Monitor – CHECKED & SECURED
   B. Nozzle – Check for security and kinking of foam concentrate supply line.

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9. (**If Equipped**) Foam Concentrate Level – CHECKED. At least 1 inch from the top of the foam tank.

⚠ WARNING

Ensure PPE fall arrest harness is worn, adjusted properly and attached to an anchor point. Failure to use PPE properly may result in personnel injury or death.

10. Tank Drain Petcocks – CLOSED

11. Sprayheads – SECURED

12. Water Pump – CHECKED
    A. Check to ensure drains are closed.
    B. Check pump case and drive motor for signs of overheating.
    C. Check drive motor and hosing for signs of hydraulic leaks.

13. Hose Reel – CHECKED

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SPRAY HEAD SYSTEM

NOTE

Operating more than 4 spray heads simultaneously will greatly reduce the width and flow of active spray heads.

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. (If Equipped) INTERMITTENT TIMER – SET
   A. TIMER ON/OFF Dials – SET
   B. INTERMITTENT Switch – SET

3. PUMP Switch/Lever – ON

   CAUTION

   Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

4. Individual Spray Heads – SELECTED

Once operations are complete:

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5. PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

6. (If Equipped) Cab Control SYSTEM Switch – OFF

DUMP BAR

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. (If Equipped) INTERMITTENT TIMER – SET AS REQUIRED
   A. Timer ON/OFF Dials – SET
   B. INTERMITTENT Switch – SET

3. PUMP Switch/Lever – ON.

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

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4. DUMP Bar Switch – ON

Once operations are complete:

5. PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

6. (If Equipped) Cab Control SYSTEM Switch – OFF

MONITOR

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. PUMP Switch/Lever - ON

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

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3. Monitor – Pointed in a safe direction.

4. MONITOR Switch – ON

5. Monitor Joystick – As Required

6. MONITOR Switch – OFF

Once operations are complete:

7. Monitor Nozzle - STOW

CAUTION

Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on monitor joints. Leaving the nozzle in any other position will cause increased wear on monitor joints and result in premature joint failure.

8. PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

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9. (If Equipped) Cab Control SYSTEM Switch - OFF

FIRE SUPPRESSION SYSTEM

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. PUMP Switch/Lever - ON

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

3. Monitor – Pointed in a safe direction.

4. FOAM Switch – ON

5. MONITOR Switch – ON

6. Monitor Joystick – As Required

Once operations are complete:

7. FOAM Switch – OFF

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Appendix

8. Monitor – Flow water through the monitor nozzle with the foam switch off to flush foam from the nozzle.

9. MONITOR Switch – OFF

10. Monitor Nozzle - STOW

CAUTION

Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on monitor joints. Leaving the nozzle in any other position will cause increased wear on monitor joints and result in premature joint failure.

11. PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

12. (If Equipped) Cab Control SYSTEM Switch – OFF

13. Vehicle – Wash or fresh water rinse areas exposed to the foam spray.

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TANK DRAIN

1. (If Equipped) Cab Control SYSTEM Switch – ON

2. PUMP Switch/Lever – ON

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

3. DRAIN Switch - ON

4. Water Level – Drain to desired level.

CAUTION

Do not operate the water pump in a dry sump. Dry running operation will cause water pump failure.

Once operations are complete:

5. DRAIN Switch – OFF

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6. PUMP Switch/Lever – OFF.

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

7. (If Equipped) Cab Control SYSTEM Switch – OFF.

HOSE REEL

1. Hose Nozzle – CLOSED.

2. Hose – Deploy desired length.

3. Gate Valve - OPEN

4. (If Equipped) Cab Control SYSTEM Switch – ON
PUMP Switch – ON.

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

5. (If Equipped) HOSE REEL Switch – ON

6. Vehicle RPM – SET

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7. Vehicle RPM – SET

8. Hose Nozzle – OPEN as desired.

Once operations are complete:

9. Hose Nozzle – CLOSE

10. (If Equipped) HOSE REEL Switch – OFF

11. Vehicle RPM – LOW IDLE PUMP Switch/Lever – OFF

CAUTION

Engaging/disengaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

12. (If Equipped) Cab Control SYSTEM Switch- OFF

13. Gate Valve – CLOSED

14. Hose – Reel in and stow hose nozzle.

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AFTER OPERATIONS

These procedures are used to perform a walk-around inspection after using the MEGA water tanker systems. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Vehicle parking brake – ON
2. Cab Control Switches – SET OFF
3. Chocks – As Required
4. Bumper Sprayheads – SECURED & SET
5. Gooseneck Hoses & Lines – CHECKED & SECURED
6. Solenoid Control Box - CHECKED
7. Monitor – CHECKED & SECURED
8. Vehicle Hydraulic Tank – CHECKED AS REQUIRED

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9. Tank Drain Petcocks – As Required.

10. Spray Heads – SECURED & SET

11. Water Pump – CHECKED
    C. Water Pump – Check for damage and volute case drain valve set as required.

12. Hose Reel – CHECKED

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